

WHAT IS CLAIMED IS:

Sub 1
a/ 1. A device for flicker filtering a plurality of non-interlaced lines containing computer graphics data to form a plurality of interlaced lines, the device programmable to combine either two or three non-interlaced lines to form each interlaced line, the device comprising:

2 a data packer having an input and two outputs for converting
3 data from an external format to an internal format, the
4 two outputs adapted to write data in the internal
5 format to a first line buffer and to a second line
6 buffer respectively;

7 a data unpacker having two inputs and two outputs for
8 converting data read from the first and second line
9 buffers from the internal format to the external
10 format, the two inputs adapted to receive data read
11 from the first line buffer and from the second line
12 buffer respectively, the first output adapted to output
13 data in the external format; and

14 a filter circuit having two inputs and an output for
15 combining data received at the two inputs into filtered
16 data, the first input adapted to receive data
17 containing video information in the external format,
18 the second input coupled to receive data from the
19 second output of the data unpacker, the output coupled
20 to send the filtered data in the external format to the
21 input of the data packer.

1 2. The device of claim 1 wherein:

2 the data packer further has a second input adapted to
3 receive data containing computer graphics in the
4 external format.

1 3. The device of claim 1 further comprising:

2 a line buffer write control circuit, adapted to receive an
3 external control signal including a clock, adapted to
4 send a line buffer write control signal to the first
5 and second line buffers, and coupled to send a data
6 packer control signal to the data packer, for
7 generating the line buffer write control signal and the
8 data packer control signal in response to the external
9 control signal; and

10 a line buffer read control circuit, adapted to receive the
11 external control signal, adapted to send a line buffer
12 read control signal to the first and second line
13 buffers, and coupled to send a data unpacker control
14 signal to the data unpacker, for generating the line
15 buffer read control signal and the data unpacker
16 control signal in response to the external control
17 signal.

1 4. The device of claim 3 wherein the line buffer read
2 control signal comprises:

3 a first read pulse for reading from the first line buffer;
4 and

5 a second read pulse for reading from the first line buffer.

1 5. The device of claim 4 wherein:

2 a first read pulse increments a first pointer to the first
3 line buffer; and
4 the second read pulse increments a second pointer to the
5 first line buffer.

1 *Sub* 6. The device of claim 1 comprising:
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2 a color space converter adapted to receive data in a second
3 external format, for converting the data from the
4 second external format to the external format.

1 7. The device of claim 6 wherein:

2 the second external format is an RGB format; and
3 the external format is a 4:4:4 signed YCrCb format.

1 8. The device of claim 1 wherein:

2 the external format is a 4:4:4 signed YCrCb format.

1 9. The device of claim 8 wherein:

2 the internal format is programmably selected from a group
3 consisting of a 4:4:4 YCrCb format, a 4:2:2 YCrCb
4 format, and a 4:1:1 YCrCb format.

1 10. The device of claim 1 further comprising:

2 an output control circuit adapted to receive a non-
3 interlaced mode control signal and adapted to send an
4 interlaced mode control signal, for converting the non-

interlaced mode control signal to the interlaced mode control signal.

11. The device of claim 10 wherein the non-interlaced mode control signal includes a first horizontal sync signal, a first vertical sync signal, a vertical blank signal, and a horizontal blank signal; and the interlaced mode control signal includes a second horizontal sync signal, a second vertical sync signal, and a blank signal.

12. A method for flicker filtering a plurality of non-interlaced lines to form a plurality of interlaced lines, the method comprising the steps of:

receiving a non-interlaced line in an external format; converting the received non-interlaced line from the external format to an internal format; retrieving an intermediate line in the internal format from a line buffer; combining the non-interlaced and intermediate lines to form a filtered line in the internal format; and converting the filtered line from the internal format to the external format to form an interlaced line.

13. The method of claim 12 wherein the external format is a 4:4:4 signed YCrCb format.

14. The method of claim 13 further comprising the step of:

2 selecting the internal format from a group consisting of a
3 4:4:4 YCrCb format, a 4:2:2 YCrCb format, and a 4:1:1
4 YCrCb format.

1 *Sub a3* 15. A method for flicker filtering a plurality of non-
2 interlaced lines to form a plurality of interlaced lines, each
3 interlaced line formed from two non-interlaced lines, the method
4 utilizing a line buffer and comprising the steps of:
5 receiving a first non-interlaced line and writing said line
6 to a line buffer;
7 simultaneously reading the first non-interlaced line from
8 the line buffer, receiving a second non-interlaced
9 line, combining the first and second non-interlaced
10 lines to form an interlaced line, and writing the
11 interlaced line to the line buffer; and
12 repeating the above steps to form a plurality of interlaced
13 lines.

1 16. A method for flicker filtering a plurality of non-
2 interlaced lines to form a plurality of interlaced lines, each
3 interlaced line formed from three non-interlaced lines, the
4 method utilizing two line buffers and comprising the steps of:
5 receiving a first non-interlaced line and writing said line
6 to a first line buffer;
7 simultaneously reading the first non-interlaced line from
8 the first line buffer, reading a second non-interlaced
9 from a second line buffer, receiving a third non-
10 interlaced line and writing said line to the second

11 line buffer, combining the first, second and third non-
12 interlaced lines to form an interlaced line, and
13 writing the interlaced line to the first line buffer;
14 and
15 repeating the above steps to form a plurality of interlaced
16 lines.

1 17. A method for flicker filtering a plurality of non-
2 interlaced lines to form a plurality of interlaced lines, each
3 interlaced line formed from three non-interlaced lines, the
4 method utilizing two line buffers and comprising the steps of:
5 simultaneously reading a first non-interlaced line from a
6 first line buffer, receiving a second non-interlaced
7 line, combining the first and second non-interlaced
8 lines to form an intermediate line, and writing the
9 intermediate line to a second line buffer;
10 simultaneously reading the intermediate line from the second
11 line buffer, receiving a third non-interlaced line and
12 writing said line to the first line buffer, combining
13 the intermediate and third non-interlaced lines to form
14 an interlaced line, and writing the interlaced line to
15 the second line buffer; and
16 repeating the above steps to form a plurality of interlaced
17 lines.

1 18. A method for flicker filtering a plurality of non-
2 interlaced lines to form a plurality of interlaced lines, each

3 interlaced line formed from three non-interlaced lines, the
4 method utilizing two line buffers and comprising the steps of:

5 simultaneously reading a first non-interlaced line from a
6 first line buffer, receiving a second non-interlaced
7 line, combining the first and second non-interlaced
8 lines to form an intermediate line, and writing the
9 intermediate line to the first line buffer;

10 simultaneously reading the intermediate line from the first
11 line buffer, receiving a third non-interlaced line and
12 writing said line to the first line buffer, combining
13 the intermediate and third non-interlaced lines to form
14 an interlaced line, and writing the interlaced line to
15 a second line buffer; and

16 repeating the above steps to form a plurality of interlaced
17 lines.